ENGINEERING PHYSICS 4D3/6D3

DAY CLASS Dr. Wm. Garland
DURATION: 20 minutes
McMASTER UNIVERSITY QUIZ #2 2005-11-10

Special Instructions:

1. Closed Book. All calculators and up to 6 single sided 8 ½" by 11" crib sheets are permitted.
2. The value of each part is as indicated. TOTAL Value: 100 marks

THIS EXAMINATION PAPER INCLUDES 1 PAGE AND 1 MULTI-PART QUESTION. YOU ARE RESPONSIBLE FOR ENSURING THAT YOUR COPY OF THE PAPER IS COMPLETE. BRING ANY DISCREPANCY TO THE ATTENTION OF YOUR INVIGILATOR.

1. (Based on assignment #4, question 3) Consider a homogeneous slab of fuel / moderator coolant with known properties, thickness 'a' and infinite in the other 2 dimensions. Assume one-speed neutrons. For this solution, devise a "controller" to adjust the absorption term (not the fission term) so that a steady state is reached.
    a. Write the governing differential partial differential equation (PDE) for the transient solution.
    b. Write the finite difference form of the PDE using the semi-implicit method. Adopt an eqi-spaced grid.
    c. Outline a solution algorithm.
    d. Sketch the center-line flux and absorption as a function of time that you might expect.

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